

Biological Engineering 4290
Senior Engineering Design and Professionalism
Credit Hours: 2 (2 hours lecture)
Fall Semester 2008
9:40 – 10:30 Tuesdays and Thursdays
127 Tureaud Hall

Instructor: Marybeth Lima, Ph.D., P.E., Room 159 E.B. Doran Building, phone: 578.1061, e-mail: mlimal@lsu.edu. **Office hours:** Tuesdays 1:00 – 3:00 or by appointment.

Course Description: Capstone project selection and design (for building and testing in BE 4292); completion of project feasibility study and outline of design project; ordering necessary parts; design philosophy, teamwork, and communication; economics; product liability and reliability; use of standards and codes; goal setting and time management.

Prerequisite: Senior standing in the College of Engineering; completion or current enrollment in BE 4303.

Objectives: to develop a team design project for completion in BE 4292. To become familiar with the process and philosophy of design and engineering professionalism.

Accreditation: The Accreditation Board of Engineering and Technology (ABET) has established criteria through which engineering programs, including this one, are accredited. When you complete the Biological Engineering curriculum at LSU, you should be proficient in the objectives listed below. This course and BE 4292 are intended to help you “tie together” all your basic and applied engineering courses in a project-based, pre-professional engineering experience and will assist your mastery of these objectives:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs
- (d) an ability to function on multi-disciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
- (i) a recognition of the need for, an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Required Text:

- Engineering Design (3rd Edition), by George Dieter

NOTE: The fourth edition of this textbook is now available and can also be used.

References:

- A Mechanical Design Process, by David Ullman

- Creative Problem Solving and Engineering Design, by Edward Lumsdaine, Monika Lumsdaine, and J. William Shelnutt
- Fundamentals of Engineering Reference Manual, Michael Lindeburg
- Fundamentals of Engineering Supplied Reference Handbook, National Council of Examiners for Engineering and Surveying
- Strategies for Engineering Communication, by Susan Stevenson and Steve Whitmore

Grading Breakdown:

Homework	20%
(includes design homeworks, progress reports, and notebooks)	
Exam on engineering methods	20%
Final written report	20%
Final presentation	15%
Individual grade	25%
(assigned by instructor in consultation with faculty advisor(s))	

Late homework assignments will receive 20% off for each day they're late (20% if one day late, 40% if two days late, etc.). Assignments are due to Angie in the front office by 4:30 p.m.

Course grades will be determined on the following scale: A (90 – 100%), B (80 – 89%), C (70 – 79%), D (60 – 69%), F (<59%). Remember, if you are on the border between letter grades, coming regularly to class, participating in class, and following class rules (see below), you will get you the higher letter grade.

Final comments:

Once again, I will do everything I can to make each of you shine in this course! This is it, folks!!! Senior design is extremely important and can have a huge impact on the type of employment you are offered, the graduate/professional work you continue, etc. I am honored to be your instructor in your first *and* your last year of this curriculum! Remember class rules!

- Turn off your cell phone before class starts!
- Cheating and plagiarism will not be tolerated under any circumstances!
- Be respectful of yourself and each other (don't interrupt each other, listen to each other, seek to understand before being understood, and so on)

Tips for senior design

- Bring questions and comments to class; on-going dialogue about engineering, design, and professionalism will enrich your experiences in this course and will help your design project!
- Teamwork is the key to success in this course!
- If you have trouble with your teams, try to work within your team first. If the issue doesn't resolve, please consult with me and your project advisor immediately.
- Block out time for senior design every week and use it (work steadily) vs. dropping it for a couple of weeks and then working intensely on it (don't work in spurts)
- Slacking will hurt your grade immensely in this course!

Approximate schedule

8/25	go over syllabus
8/27	chapter 1, Dieter: the product design process
9/1	no class, labor day ☺
9/3	chapter 3: team behavior and tools
9/8	chapter 2: need identification and problem definition
9/10	chapter 2: need identification and problem definition
9/15	chapter 2: need identification and problem definition
9/17	group presentations
9/22	group presentations
9/24	group presentations
9/29	chapter 4: gathering information
10/1	chapter 5: concept generation and evaluation
10/6	chapter 5: concept generation and evaluation
10/8	chapter 5: concept generation and evaluation
10/13	review of engineering methods for exam
10/15	exam, engineering methods
10/20	chapter 8: materials selection
10/22	chapter 8: materials selection
10/27	guest presentation: Monique Magee, project engineer, Syngenta (2006-2007 senior design student)
10/29	group presentations
11/3	group presentations
11/5	group presentations
11/10	chapter 10: engineering statistics
11/12	CxC studio visit

- 11/17 chapter 11: risk, reliability, and safety
- 11/19 chapter 11: risk, reliability, and safety
- 11/24 guest lecture: patents
- 11/26 float time to finish class material, etc.
- 12/1 Final Presentations, 4:30 – 8:00 pm (no class during the day, unless you want to practice in front of me)
- 12/3 Celebration, evaluate course, etc. You finished the first half of capstone! 😊